FORSPAN ASSESSMENT MODEL FOR CONTINUOUS ACCUMULATIONS--BASIC INPUT DATA FORM (NOGA, Version 7, 6-30-00)

IDENTIFICATION INFORMATION

Assessment Geologist:…	C.S. Swezey	Date:	1/17/2002
Region:……	North America	Number:	5
Province:……	Appalachian Basin	Number:	5067
Total Petroleum System:.	Devonian Shale-Middle and Upper Paleozoic	Number:	506704
Assessment Unit:…….	Berea Sandstone	Number:	50670466
Based on Data as of:……	State-Supplied Data, Atlas of Major Appalachian Gas Plays (1996), PI/Dwights (2000)		
Notes from Assessor…..	Replaces part of play 6725. Data for discovery-history segments reflects only past 15 to 20 years.		

CHARACTERISTICS OF ASSESSMENT UNIT

Assessment-Unit type: **Oil** (<20,000 cfg/bo) **or** **Gas** (≥20,000 cfg/bo) Gas

What is the minimum total recovery per cell?… 0.01 (mmbo for oil A.U.; bcfg for gas A.U.)

Number of tested cells:…… 60000

Number of tested cells with total recovery per cell ≥ minimum: …….. 54000

Established (>24 cells ≥ min.) X Frontier (1-24 cells) _____ Hypothetical (no cells) _____

Median total recovery per cell (for cells ≥ min.): (mmbo for oil A.U.; bcfg for gas A.U.)

1st 3rd discovered 0.065 2nd 3rd 0.03 3rd 3rd 0.033

Assessment-Unit Probabilities:

Attribute	Probability of occurrence (0-1.0)
1. **CHARGE:** Adequate petroleum charge for an untested cell with total recovery ≥ minimum ……	1.0
2. **ROCKS:** Adequate reservoirs, traps, seals for an untested cell with total recovery ≥ minimum.	1.0
3. **TIMING:** Favorable geologic timing for an untested cell with total recovery ≥ minimum……..	1.0

Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):…….....…… 1.0

4. **ACCESS:** Adequate location for necessary petroleum-related activities for an untested cell with total recovery ≥ minimum …… 1.0

NO. OF UNTESTED CELLS WITH POTENTIAL FOR ADDITIONS TO RESERVES IN THE NEXT 30 YEARS

1. Total assessment-unit area (acres): (uncertainty of a fixed value)
   minimum 31,532,000 median 33,192,000 maximum 34,852,000

2. Area per cell of untested cells having potential for additions to reserves in next 30 years (acres):
   (values are inherently variable) minimum 10 median 40 maximum 80

3. Percentage of total assessment-unit area that is untested (%): (uncertainty of a fixed value)
   minimum 90.3 median 92.6 maximum 94.7

4. Percentage of untested assessment-unit area that has potential for additions to reserves in next 30 years (%): (a necessary criterion is that total recovery per cell ≥ minimum)
   (uncertainty of a fixed value) minimum 3 median 19 maximum 55

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TOTAL RECOVERY PER CELL

Total recovery per cell for untested cells having potential for additions to reserves in next 30 years:
(values are inherently variable)
(mmbo for oil A.U.; bcfg for gas A.U.) minimum 0.01 median 0.03 maximum 0.5

AVERAGE COPRODUCT RATIOS FOR UNTESTED CELLS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

Oil assessment unit:	minimum	median	maximum
Gas/oil ratio (cfg/bo)…….……			
NGL/gas ratio (bngl/mmcfg)…….….			
Gas assessment unit:			
Liquids/gas ratio (bliq/mmcfg)…..……..……	12	24	36

SELECTED ANCILLARY DATA FOR UNTESTED CELLS

(values are inherently variable)

Oil assessment unit:	minimum	median	maximum
API gravity of oil (degrees)…….……			
Sulfur content of oil (%)……..…			
Drilling depth (m) ……..……..……			
Depth (m) of water (if applicable)…….			
Gas assessment unit:			
Inert-gas content (%)……..……..	0.0	0.1	1.0
CO_2 content (%)……..……..	0.0	0.1	1.0
Hydrogen-sulfide content (%)……..…….	0.0	0.0	0.1
Drilling depth (m)…….	100	500	2000
Depth (m) of water (if applicable)…….			

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ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO STATES

Surface Allocations (uncertainty of a fixed value)

1. Kentucky represents 7.72 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		20	
Portion of volume % that is offshore (0-100%)..		0	

2. Maryland represents 0.28 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		0	
Portion of volume % that is offshore (0-100%)..		0	

3. Ohio represents 34.67 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		25	
Portion of volume % that is offshore (0-100%)..		0	

4. Pennsylvania represents 30.57 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		10	
Portion of volume % that is offshore (0-100%)..		0	

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5. Virginia represents 3.17 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		15	
Portion of volume % that is offshore (0-100%)..		0	

6. West Virginia represents 23.6 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		30	
Portion of volume % that is offshore (0-100%)..		0	

7. _____ represents _____ areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

8. _____ represents _____ areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

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ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO LAND ENTITIES

Surface Allocations (uncertainty of a fixed value)

1. Federal Lands represents 5.95 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		10	
Portion of volume % that is offshore (0-100%)..		0	

2. Private Lands represents areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

3. Tribal Lands represents areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

4. Other Lands (includes private, state, etc) represents 94.05 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		90	
Portion of volume % that is offshore (0-100%)..		0	

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5. OH Offshore represents 0 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		0	
Portion of volume % that is offshore (0-100%)..		100	

6. _____ represents _____ areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

7. _____ represents _____ areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

8. _____ represents _____ areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

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9. _____ represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

10. _____ represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

11. _____ represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

12. _____ represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

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ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO FEDERAL LAND SUBDIVISIONS
Surface Allocations (uncertainty of a fixed value)

1. Bureau of Land Management (BLM) represents _____ areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

2. BLM Wilderness Areas (BLMW) represents _____ areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

3. BLM Roadless Areas (BLMR) represents _____ areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

4. National Park Service (NPS) represents _____ areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

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5. NPS Wilderness Areas (NPSW) represents areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

6. NPS Protected Withdrawals (NPSP) represents areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

7. US Forest Service (USFS) represents 5.46 areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

Gas in gas assessment unit:			
Volume % in entity……		9	
Portion of volume % that is offshore (0-100%)..		0	

8. USFS Wilderness Areas (USFSW) represents areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

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9. USFS Roadless Areas (USFSR) represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

10. USFS Protected Withdrawals (USFSP) represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

11. US Fish and Wildlife Service (USFWS) represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

12. USFWS Wilderness Areas (USFWSW) represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

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13. USFWS Protected Withdrawals (USFWSP) represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

14. Wilderness Study Areas (WS) represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

15. Department of Energy (DOE) represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

16. Department of Defense (DOD) represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

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17. Bureau of Reclamation (BOR) represents areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

18. Tennessee Valley Authority (TVA) represents areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

19. Other Federal represents 0.49 areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		1	
Portion of volume % that is offshore (0-100%)..		0	

20. _____ represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

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ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO ECOSYSTEMS

Surface Allocations (uncertainty of a fixed value)

1. Allegheny Mountains (ALMT) represents 7.99 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		1	
Portion of volume % that is offshore (0-100%)..		0	

2. Central Till Plains, Beech-Maple (CTPB) represents 2.46 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		1	
Portion of volume % that is offshore (0-100%)..		0	

3. Erie and Ontario Lake Plain (EOLP) represents 0.23 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		0	
Portion of volume % that is offshore (0-100%)..		0	

4. Northern Cumberland Mountains (NCMT) represents 8.64 areal % of the assessment unit

	minimum	median	maximum
Oil in oil assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		15	
Portion of volume % that is offshore (0-100%)..		0	

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5. Northern Cumberland Plateau (NCPT) represents 1.66 areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		1	
Portion of volume % that is offshore (0-100%)..		0	

6. Northern Ridge & Valley (NRVA) represents 0.97 areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		1	
Portion of volume % that is offshore (0-100%)..		0	

7. Northern Unglaciated Allegheny Plateau (NUAP) represents 6.35 areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		1	
Portion of volume % that is offshore (0-100%)..		0	

8. Southern Cumberland Mountains (SCMT) represents 0.49 areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		2	
Portion of volume % that is offshore (0-100%)..		0	

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9. Southern Unglaciated Allegheny Plateau (SUAP) represents 54.14 areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		70	
Portion of volume % that is offshore (0-100%)..		0	

10. Western Glaciated Allegheny Plateau (WGAP) represents 17.06 areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……		8	
Portion of volume % that is offshore (0-100%)..		0	

11. _____ represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

12. _____ represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

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ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO LAND ENTITIES
Subsurface Allocations (uncertainty of a fixed value)

Based on Data as of: _____

1. All Federal Subsurface represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			

2. Other Subsurface represents _____ areal % of the assessment unit

Oil in oil assessment unit:	minimum	median	maximum
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			
Gas in gas assessment unit:			
Volume % in entity……			
Portion of volume % that is offshore (0-100%)..			